

Inhalation Exposure and Toxic Effects of Mycotoxins

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Chapter

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Abstract

This chapter addresses the differences in exposure to mycotoxins via inhalation as they differ from the ingestion exposure route. Inhalation exposure gives direct access to the general circulation through the alveoli, without a first pass through the liver for detoxification as the ingestion route does. Inhalation exposure also provides a pathway to the central nervous system along the olfactory and trigeminal nerve axons in the nasal sensory epithelium that bypasses the blood–brain barrier. The brain is generally shielded from contaminants or drugs through the action of the blood–brain barrier. Secondary metabolites of microfungi (molds) and bacteria are present on and in spores and cellular fragments and on dust on which the organisms grow and excrete their toxins, for which the small particle fraction represents the primary exposure medium via inhalation. Deposition of these small particles occurs throughout the respiratory tract, but especially in the alveoli where transport to the bloodstream largely occurs, resulting in toxin distribution to other systemic target organs. Evidence for brain and systemic effects from mycotoxins is presented in this chapter. The complexity of secondary metabolites produced through interaction and competition among microfungi and bacteria in damp indoor environments is discussed.

Keywords

Secondary metabolites Mycotoxins Inhalation exposure Paranasal sinuses
Olfactory nerve transport Particle deposition Biofilms Microbial interactions
Damp buildings Genome mining

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